

LAKE OKEECHOBEE WATER SUPPLY BACKPUMPING AFTER ACTION REPORT

June 22–29, 2001



Prepared for
Florida Department of Environmental Protection
by
Environmental Monitoring and Assessment Department
and
Everglades Regulation Department
SFWMD

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Table 1. Pump Operation Logs and Daily Flows for S2 and S3.

S2 Pump

Date	(cfs)*1	acre-feet	Pump Log (approximate time)
06/22/2001 Friday	0	0	
06/23/2001 Saturday	0	0	
06/24/2001 Sunday	0	0	
06/25/2001 Monday	379	751	starts at 8:50 AM, ends at 5:00 PM
06/26/2001 Tuesday	688	1365	starts at 9:18 AM
06/27/2001 Thursday	283	562	ends at 6:00 AM
06/28/2001 Friday	802	1590	starts at 7:04 AM
06/29/2001 Saturday	170	337	ends at 6:25 AM

S3 Pump

Date	(cfs)*1	acre-feet	Pump Log (approximate time)
06/22/2001 Friday	192	382	starts at 1:31 PM, ends at 6:36 PM
06/23/2001 Saturday	308	610	starts at 8:10 AM, ends at 3:00 PM
06/24/2001 Sunday	0	0	
06/25/2001 Monday	322	638	starts 5:58 AM, ends at 5:00 PM
06/26/2001 Tuesday	416	825	starts at 1:18 PM
06/27/2001 Thursday	159	316	ends at 4:10 AM
06/28/2001 Friday	480	951	starts at 8:40 AM, ends at 9:00 PM
06/29/2001 Saturday	0	0	ends at 6:25 AM

note: *1 daily mean flow expressed in cfs

Table 2. S2 Daily Flow, Total Phosphorus, and Total Nitrogen Concentration and Loads for June 25, 2001 through June 29, 2001 Back Pumping Event

Date	Flow (acre-feet)	Total Phosphorus (TP)			Total Nitrogen (TN)		
		grab (mg/L)	composite (mg/L)	loads (1000kg)	grab (mg/L)	composite (mg/L)	loads (1000kg)
6/22/2001	0			0.000			0.000
6/23/2001	0			0.000			0.000
6/24/2001	0			0.000			0.000
6/25/2001	751	0.142	0.140	0.130		4.180	3.874
6/26/2001	1365			0.236			7.040
6/27/2001	562			0.097			2.896
6/28/2001	1591	0.077	0.103	0.202		3.179	6.238
6/29/2001	337			0.043			1.320
6/30/2001	0			0.000			0.000
Sum	4606			0.707			21.368

note: All flow data are preliminary estimation. All water quality data are provisional data.

note: Loads are calculated using the auto sampler concentrations, which are flow proportional composite samples.

Table 3. S3 Daily Flow, Total Phosphorus, and Total Nitrogen Concentration and Loads for June 22, 2001 through June 28, 2001 Back Pumping Event

Date	Flow (acre-feet)	Total Phosphorus (TP)			Total Nitrogen (TN)		
		grab (mg/L)	composite (mg/L)	loads (1000kg)	grab (mg/L)	composite (mg/L)	loads (1000kg)
6/22/2001	382	0.041	0.048	0.027	3.615	3.955	2.224
6/23/2001	610			0.042			3.435
6/24/2001	0			0.000			0.000
6/25/2001	638	0.049	0.053	0.042	4.923	4.419	3.477
6/26/2001	825			0.054			4.492
6/27/2001	316			0.019			1.719
6/28/2001	951	0.039	0.05	0.067	4.362	3.748	4.988
6/29/2001	0			0.000			0.000
6/30/2001	0			0.000			0.000
Sum	3721			0.249			20.334

note: All flow data are preliminary estimation. All water quality data are provisional data.

note: Loads are calculated using the auto sampler concentrations, which are flow proportional composite samples.

Table 4. Water Quality Data at S2 During June 25-29, 2001 Backpumping Events

Parameters	Sampling Dates		FAC 62-302 Class I Criteria
	6/25/2001	6/28/2001	
Physical			
Water Temperature (°C)	28.62	27.89	
Specific Conductivity (µmhos/cm)	1063	1087	Not greater than 50% above background or 1,275 µmhos/cm
Dissolved Oxygen (mg/L)	5.67	3.36	Not less than 5.0 mg/L
Water pH (units)	7.15	7.11	Not less than 6.0 or greater than 8.5 units
Turbidity (NTU)	5.02	4.5	Less than or equal to 29 NTU above background
Color (PCU)	133	134	
Total Suspended Solids (mg/L)	12.4	8	
Total Dissolved Solids (mg/L)	695	694	
Hardness as CaCO3 (mg/L)	410.7	414.4	
Alkalinity as CaCO3 (mg/L)	270.4	331.6	
Nutrients			
Ammonium as N (mg/L)	0.17	0.208	
Un-ionized Ammonia as NH ₃ (mg/L)	0.002	0.002	Equal or less than 0.02 mg/L as NH ₃
Nitrite as N (mg/L)	0.156	0.063	
Nitrate+Nitrite as N (mg/L)	1.408	0.799	
Nitrate (mg/L)	1.252	0.736	Equal or less than 10 mg/L as N
Total Kjeldahl Nitrogen (mg/L)	3.239	2.971	
Total Dissolved Kjeldahl Nitrogen (mg/L)	2.335	2.644	
Total Nitrogen (mg/L)	4.647	3.77	
Orthophosphate as P (mg/L)	0.023	0.029	
Total Phosphorus (mg/L)	0.142	0.077	
Total Dissolved Phosphorus (mg/L)	0.031	0.037	
Silica (mg/L)	15.637	12.322	
Major Ions			
Chloride (mg/L)	103.21	104.09	Equal or less than 250 mg/L
Sulfate (mg/L)	111.43	79.34	
Sodium (mg/L)	70.131	63.263	
Potassium (mg/L)	8.293	9.862	
Calcium (mg/L)	113.631	115.783	
Magnesium (mg/L)	30.844	30.446	
Phytoplankton Indicators			
Chlorophyll a (µg/L)	159.2		
Chlorophyll a2 (µg/L)			
Chlorophyll b (µg/L)	<1	<1	
Chlorophyll c (µg/L)		3.1	
Pheophytin a (µg/L)	4.2		
Carotenoid (µg/L)	56		
Dissolved Organic Carbon (mg/L)	35.96	42.11	
Total Organic Carbon (mg/L)	37.69	43.52	
Trace Metals			
Total Arsenic (µg/L)	6.135	4.839	Less than or equal to 50 µg/L
Total Cadmium (µg/L)	<0.3	<0.3	Less than or equal to calculated value
Total Copper (µg/L)	2.746	2.687	Less than or equal to calculated value
Total Iron (µg/L)	136.396	136.083	Less than or equal to 300 µg/L
Total Lead (µg/L)	<0.8	<0.8	Less than or equal to calculated value
Total Zinc (µg/L)	<4	<4	Less than or equal to calculated value

**Table 4 (Continued). Water Quality Data at S2 During June 22-28, 2001
Backpumping Events**

Parameters	Sampling Dates			FAC 62-302 Class I Criteria
	6/22/2001	6/25/2001*	6/28/2001*	
Pesticides				
ametryn (µg/L)	--	0.11	0.085	
atrazine (µg/L)	--	9.4	2.5	
atrazine desethyl (µg/L)	--	0.18	0.091	
atrazine desisopropyl (µg/L)	--	0.032	0.015	
simazine (µg/L)	--	0.043	0.012	

* average of duplicate values

BDL = below detection limit

Table 5. Water Quality Data at S3 During June 22-28, 2001 Backpumping Events

Parameters	Sampling Dates			FAC 62-302 Class I Criteria
	6/25/2001	6/25/2001	6/28/2001	
Physical				
Water Temperature (°C)	29.25	28.63	28.24	
Specific Conductivity (µmhos/cm)	948	1124	937	Not greater than 50% above background or 1,275 µmhos/cm
Dissolved Oxygen (mg/L)	3.83	7.23	4.02	Not less than 5.0 mg/L
Water pH (units)	7.27	7.23	7.31	Not less than 6.0 or greater than 8.5 units
Turbidity (NTU)	3.34	4.25	2.85	Less than or equal to 29 NTU above background
Color (PCU)	90	122	123	
Total Suspended Solids (mg/L)	6	6	5.2	
Total Dissolved Solids (mg/L)	606	735	624	
Hardness as CaCO3 (mg/L)	315.4	370.6	357.4	
Alkalinity as CaCO3 (mg/L)	217.6	255.7	261.8	
Nutrients				
Ammonium as N (mg/L)	0.106	0.446	0.133	
Un-ionized Ammonia as NH ₃ (mg/L)	0.002	0.007	0.002	Equal or less than 0.02 mg/L as NH ₃
Nitrite as N (mg/L)	0.057	0.132	0.123	
Nitrate+Nitrite as N (mg/L)	1.26	2.043	1.586	
Nitrate (mg/L)	1.203	0.736	1.463	Equal or less than 10 mg/L as N
Total Kjeldahl Nitrogen (mg/L)	2.355	2.88	2.776	
Total Dissolved Kjeldahl Nitrogen (mg/L)	2.05	2.7	2.425	
Total Nitrogen (mg/L)	3.615	4.923	4.362	
Orthophosphate as P (mg/L)	0.008	0.011	0.009	
Total Phosphorus (mg/L)	0.041	0.049	0.039	
Total Dissolved Phosphorus (mg/L)	0.012	0.014	0.013	
Silica (mg/L)	11.378	16.242	9.948	
Major Ions				
Chloride (mg/L)	114.95	129.64	90.58	Equal or less than 250 mg/L
Sulfate (mg/L)	79.24	107.5	76.58	
Sodium (mg/L)	68.069	88.322	50.964	
Potassium (mg/L)	7.117	8.774	7.56	
Calcium (mg/L)	91.723	102.493	104.962	
Magnesium (mg/L)	20.974	27.866	23.157	
Phytoplankton Indicators				
Chlorophyll a (µg/L)	26	46.9	15.3	
Chlorophyll a2 (µg/L)	22.9	39.1	12.2	
Chlorophyll b (µg/L)	<1	8.6	<1	
Chlorophyll c (µg/L)	2	1.6	1.1	
Pheophytin a (µg/L)	3.7	11.5	4.4	
Carotenoid (µg/L)	9.8	17	6.3	
Dissolved Organic Carbon (mg/L)	30.03	33.88	38.11	
Total Organic Carbon (mg/L)	30.51	36	38.24	
Trace Metals				
Total Arsenic (µg/L)	3.917	5.06	4.306	Less than or equal to 50 µg/L
Total Cadmium (µg/L)	<0.3	<0.3	<0.3	Less than or equal to calculated value
Total Copper (µg/L)	1.96	2.124	2.386	Less than or equal to calculated value
Total Iron (µg/L)	85.045	98.014	82.751	Less than or equal to 300 µg/L
Total Lead (µg/L)	<0.8	<0.8	<0.8	Less than or equal to calculated value
Total Zinc (µg/L)	<4	<4	<4	Less than or equal to calculated value

**Table 5 (Continued). Water Quality Data at S3 During June 22-28, 2001
Backpumping Events**

Parameters	Sampling Dates			FAC 62-302 Class I Criteria
	6/22/2001*	6/25/2001*	6/28/2001*	
Pesticides				
amertyn (µg/L)	0.075	0.084	0.061	
atrazine (µg/L)	0.51	0.59	5.9	
atrazine desethyl (µg/L)	0.01	0.085	0.12	
atrazine desisopropyl (µg/L)	0.017	0.013	0.021	
simazine (µg/L)	BDL	BDL	0.025	

* average of duplicate values

BDL = below detection limit

Table 6. Daily Rainfall (in inches) for Lake Okeechobee, East EAA and West EAA, June 13-30, 2001

Day	Lake Okeechobee	East EAA	West EAA
13-Jun-01	0.15	0.1	0.01
14-Jun-01	0.08	0.08	0.48
15-Jun-01	0.02	0.2	0.22
16-Jun-01	0.19	0.12	0.02
17-Jun-01	0.15	0	0
18-Jun-01	0.07	0.05	0.21
19-Jun-01	0.15	0.3	0.63
20-Jun-01	0.12	0.09	0.01
21-Jun-01	0.55	0.16	0.17
22-Jun-01	0.36	0.47	0.25
23-Jun-01	0.04	0.22	0.09
24-Jun-01	0.33	0.34	0.5
25-Jun-01	0.42	0.23	0.04
26-Jun-01	0.11	0.09	0.3
27-Jun-01	0.27	0.03	0.25
28-Jun-01	0.22	0.59	0.23
29-Jun-01	0.18	0.15	0.07
30-Jun-01	0	0	0.01
Totals	3.41	3.22	3.49

